

## Fragmentation Effects of SW 24<sup>th</sup> Avenue Extension Through NATL

Doug Levey, Zoology Department, 11 March, 2003.

Feedback is welcome (dlevey@zoo.ufl.edu).

Habitat fragmentation is widely recognized as a leading cause of extinction in many species. When plant and animal populations become separated as a result of fragmentation, their genetic diversity is reduced and they become more susceptible to environmental changes that they would otherwise be able to weather. To compound these problems, when isolated populations go extinct their habitat is unlikely to be re-colonized by other individuals of the same species. In short, fragmentation unquestionably leads to extinction of many small populations, which in turn undermines stability of ecosystems on a much larger scale.

A central tenet of conservation biology is that negative effects of fragmentation can be diminished if habitat fragments are joined by a corridor, a relatively narrow strip of habitat connecting two patches of the same type. Corridors lower extinction rates, lessen demographic stochasticity, stem inbreeding, and facilitate recolonization of patches after local extinction. Many recent studies provide support for these functions of corridors.

NATL is already a habitat fragment, surrounded by urban development that is unfriendly to most of its inhabitants. Fortunately, NATL is well managed and currently large enough to sustain populations of many plants and small vertebrates. This situation is tenuous, however. Of particular concern are its 14 species of amphibians, practically all of which depend upon water for breeding and larval development.

The proposed extension of 24<sup>th</sup> Avenue presents a fundamental problem for NATL's amphibians because it would fragment their habitat in the worst possible way -- it would block access to their only permanent source of water, the sinkhole pond on the southeastern border of the property, near Archer Road (Fig. 1).

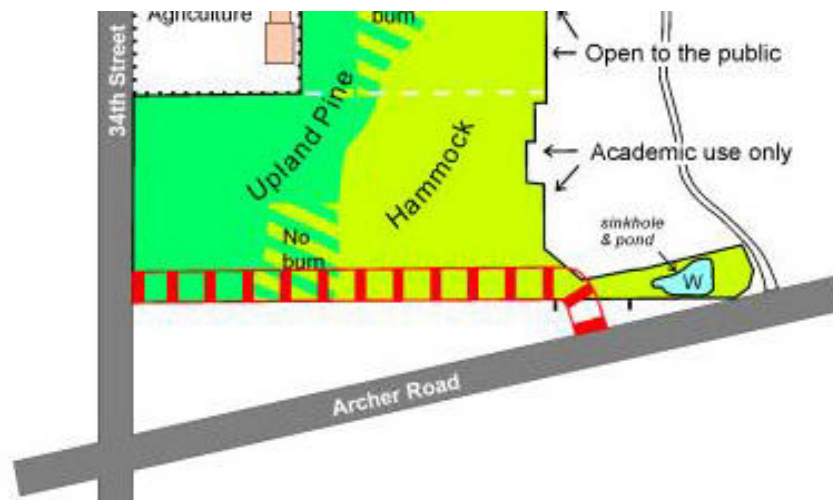


Fig. 1. The sinkhole pond is connected to the rest of NATL by a narrow corridor that will be cut by the proposed extension of SW 24<sup>th</sup> Avenue.

Although small, this pond is deep and protected from drying out by its tree canopy. It has consistently held water, even during the drought of the last several years. By contrast, the main retention pond in the SEEP area near the Entomology/Nematology building is shallow and has no canopy cover. It's dried out several times over the past five years.

Although many amphibians can breed in temporary pools, the sinkhole pond becomes critically important when all other pools dry up. It serves as a refuge and breeding site until the temporary ponds fill again and animals can disperse away from the sinkhole to these newly formed ponds. Without it, many amphibian species that currently thrive in NATL would be at risk of extinction.

The situation with respect to amphibians and the sinkhole pond is actually much worse than just described. In times of drought the sinkhole will act as a magnet to vertebrates that have relied on it in the past. They will almost certainly attempt to cross the 24<sup>th</sup> Avenue extension. If this extension serves its stated purpose of redirecting a significant amount of traffic, its impact on amphibians seeking water is certain: high road kill mortality. Rather than being a refuge in hard times, the sinkhole pond will be a deathtrap.

Although I've emphasized the importance of fragmentation and the sinkhole pond to amphibians, the same arguments hold for other vertebrates. Most are dependent on water to some degree, either for drinking or for the prey base it supports, and most will be drawn to the sinkhole pond in times of drought or whenever there is breeding activity of amphibians. They, too, will risk death crossing the road.

Finally, it's important to note that a large wetland lies east of NATL and south of the Entomology/Nematology building. It is not a part of NATL but is nonetheless a large and important additional wetland habitat for NATL's wildlife. It is currently connected to NATL via the small strip of land (a corridor) that contains the sinkhole pond. Although



Fig. 2. View westward from just inside the southwest corner of the wetlands east of the Surge Area. Surge Area Drive crosses the picture slightly above center and the trees of NATL's sinkhole pond are immediately beyond. At night, the traffic on this road is nearly nil, and in drier times smaller species can use the culvert beneath the road.

animals must cross a road (Surge Area Drive) to access it, the road is two-lane and sparsely traveled -- it's relatively safe to cross (Fig. 2). The 24<sup>th</sup> Avenue extension would sever this connection between NATL and this large wetlands, further exacerbating the problems described above.